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Monterey, California, Naval Postgraduate School

Computer Facility NEWSLETTER

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BITS AND PIECES

The 1401 finally departed on 15 May 1968, bound for PAMICONUS, Bainbridge, Maryland. It had given yoeman service at NPGS since August 1961.

And still the jobs come....15,000 processed during April, and 11,000 in the first half of May. Ninety-two percent of these jobs are student submissions. Also, the percentage of WATFOR jobs has increased from 39% in April to 50% at present. It's that time of the year when a young man's fancy turns to thoughts of a completed thesis--and reunion with his family. Incidentally, thesis students, please note the item on special graph plotting and listing services being offered.

CONSTANT FLUX

Since the last Newsletter, we have introduced Release 14 (OS/360) and ASMG, the faster Assembler described in Newsletter, Volume 1, Number 4. Major projects nearing completion include (a) exploration, generation and testing of a first MVT system at NPGS, (b) experimentation and testing of CP/67, a control program which supports both conversational terminal activity under CMS and batch processing under OS/360, and (c) development of on-line curve plotting in a multi-programming environment. (See later items for brief descriptions of (a) and (b).)

All these efforts are directed toward improving performance or offering new facilities.

CORE STORAGE PARTITIONS

Users with large programs should be aware of the maximum core storage available to them under the particular version of the operating system, OS/360. Under present conditions, the total core storage or 512K bytes on the 360/67 system is divided into these portions: the numbers in parentheses apply when running with 256 bytes of core.

CORE STORAGE PARTITIONS - continued

Partition	Core Size (in bytes) Hexadecimal	Decimal
1. Spooling System (HASP)	D,6D8	55,000
2. Batch Partition (for user programs)	65,1C8 (25,1C8)	414,152 (152,008)
3, OS/360 (supervisor, control sections, resident access method, etc.)	D,760	55,136
TOTALS	80,000 (40,000)	524,288 (262,144)

Thus, the maximum user program size which can run in the present batch partition is 65,1C8 hex bytes. Larger programs must be divided into segments, each smaller than this, and an overlay strategy employed. Although the Facility undertakes to provide service for jobs requiring this amount of core, the priority scheduling method favors the small job.

The normal FORTRAN output includes information on program size. The total size, exclusive of buffers and system control blocks, is provided at the end of the link-edit map section.

MULTIPROGRAMMING UNDER OS/360

There are two control methods being used, MFT in production and MVT in test status.

1. MFT (multiprogramming with a fixed number of tasks) allows concurrent operation of up to 4 jobs in fixed, separate partitions with priorities assigned to each partition. The maximum number of partitions and their size is defined by the Facility when generating the system. Also, these parameters can be re-defined by the operator. Our current version of OS/360 is an MFT system which uses HASP as the spooling vehicle (see item on core partitions).

2. MVT (multiprogramming with a variable number of tasks) allows (a) priority scheduling of jobs submitted for single or multiple job streams, (b) concurrent scheduling and execution of up to 15 separately protected jobs, (c) system controlled overlapping of input and output, (d) a facility for asynchronous sub-tasking within a job step, and (e) task dispatching based on priorities which may be changed by the task itself during execution.

CP/67 TIME-SHARING SYSTEM

CP/CMS is a time-sharing system consisting of two distinct components, viz., a Control Program (CP) which manages the real 360/67 resources and the Cambridge Monitor System (CMS)--Cambridge, Mass., that is--a conversational operating system which provides the terminal user with a wide range of language and task manipulative facilities. Users communicate with the system through commands for file manipulation, compilation, execution control and debugging. The CMS language support includes the standard OS/360 Assembler (F), FORTRAN IV (G), PL/1 (F) and SNOBOL.

In addition, CP can run the batch job stream under our standard OS/360 simultaneously with CMS operation. CP/67 is unconventional in being open-ended allowing independently developed operating systems and their facilities to be time-shared. Look for an announcement soon.

A BETTER WAY?

A recent sampling of the workload revealed 60 programs which involve more than one full box of cards--one used as many as five boxes. This means a lot of card handling, some of it unnecessary, for you and the operators. Could you do your job in a better way? For example, users should make maximum use of object modules to condense card decks and to avoid unnecessary recompilations of every source module each time you run. If your program is in production and is to be run many times without change, then perhaps you should store it on disk. Voluminous data might be better preserved on disk or tape. It is not difficult to benefit from these different modes of operation. See Computer Facility Technical Note, "Basic Guide to Operating System/360." Also, the Systems Programming Group will hold a tutorial/discussion on those options and other ways to improve programming efficiency at 1410, Tuesday, 28 May 1968, in Room SP-117. Come along!

BUGS DETECTED UNDER RELEASE 14

1. OS/360 fails sometimes in reading JCL cards when the user is trying to concatenate data sets.

2. The FORTRAN IV H compiler sometimes sets up the argument list incorrectly when there are more than 8 parameters and a mixture of single-variable and array names.

3. In FORTRAN IV G and H, the optional "END= " parameter in the READ statement does not work with unformatted input.

DO LOOP INDEX NOT PRESERVED

The programming consultants frequently detect errors based on misconceptions of FORTRAN DO loop conventions. One common error is to assume that the DO loop index is defined after leaving the loop either at normal termination or previous exit.

SORTING ROUTINES

Three routines are now available in the FORTRAN library to solve small sorting problems arising in users' programs. SØRTHØ sorts an array of literal information; DSSØRT sorts an array of REAL*8 numbers; SHSØRT sorts REAL*4 numbers. All use the Shell method which is considerably more efficient than simple-exchange or other methods typically tried as first attempts.

DISK FILE MANAGEMENT

Public disk space is being used up rapidly. Since the supply of money, and therefore disk packs is not inexhaustible, we are asking that users include some identification and an expiration date when creating data sets. The Facility's policy on data set management is outlined in a memorandum dated 15 May 1968. It is posted on the bulletin board outside Room SP-011. Copies can be obtained from the Administrative Office, SP-101G.

THESIS STUDENTS

As a special service to thesis students during these last hectic weeks, certain periods during the week are being set aside for the preparation of final copies of graphs, listings, etc., for inclusion in theses. Notices are posted, but if you have any questions, please contact Jerry Feuerman, Operations Supervisor, SP-101B.

INVALID PUNCH DETECTION

If your FORTRAN job generates IHC215I messages, your READ statements match their FORMATs, and you are unable to locate the invalid numeric field in your punched data by proofreading, then try the sorter in Room SP-011. First, use it to count the number of cards. If this is correct, set the selection switches to identify non-numeric punches in the card columns suspected.

WOULD YOU BELIEVE ALGOL 68?

IFIPS has just released publicly the first draft of ALGOL 68. (The previous version, ALGOL 60, is the one in our system.) It contains many new features and as one 'impartial' commentator puts it, "has come a long way toward closing the functional gap with PL/1."

FEDERAL GOVERNMENT APPROVES ASCII

The ASCII (American Standard Code for Information Interchange), authorized in the Brooks Bill (P.L. 89-306), has now been formally adopted by Executive Order. In a memo, the President stated, "The adoption of this code as a Federal standard is a major step toward minimizing costly incompatibility among our vast Federal computers and telecommunications data systems." This legislation requires that all new EDP equipment installed by the Government after 30 June 1969, must be capable of handling the new code. [Footnote: The IBM 360 computers operate internally in EBCDIC (Extended Binary Coded Decimal Interchange Code.) Thus, a translator, hardware and/or software, will be needed to 'talk' to the outside world.] The President also approved recently standards for paper tape and magnetic tape recording.

WALK, DON'T RUN, TO THE PATENT OFFICE

Section 106 of the proposed Patent Reform Act (S.1042) states: "A plan of action or set of operating instructions, in whatever form presented, to cause a controllable data processor or computer to perform selected operations shall not be patentable." And the Patent Office has "taken the view that computer programs are not patentable under present laws, and shall continue to deny applications for patent on computer programs per se." However, they now recommend that a section excluding computer programs from patentable subject matter not be included in any patent reform legislation.

NOW, ABOUT THOSE MISSING LIBRARY BOOKS....

You probably won't believe this but some readers have actually been removing books from our reference library. The librarian reports, through her tears, that 49 volumes are missing at present. To get these back, we are calling a general amnesty for all miscreants. No questions will be asked. There will be no reprisals; we promise not to staple, fold or mutilate your card decks. The book and reports collection is for reference only, serving as a ready source of information on the computer field.

Ø AND O

Just a reminder that the School's convention for card punching is; alphabetic Ø (oh) and O (zero). Be especially careful if copying program segments from IBM manuals because they are not consistent in applying this rule. For example, the illustrations in the FORTRAN IV (G) Programmer's Guide are written using the opposite convention.